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DEPARTMENT OF HEALTH
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DIVISION OF
OIL, GAS & MINING

August 15, 1988

Mr. Gerald Schurtz
B.P. Minerals America
1515 Mineral Square
Salt Lake City, Utah 84112

Re: Barney's Canyon Project
Design Criteria Approval

Dear Mr. Schurtz:

Based upon the correspondence as of 15 August 1988, on the Barney's Canyon project an agreement of acceptable design criteria between B.P. Minerals and the Utah Bureau of Water Pollution Control has been reached which is summarized below. The *design criteria* as described herein for the project is *hereby approved*. Road building, grading, leveling and other site preparation work may now commence at B.P. Mineral's own risk and according to the requirements of other local permitting agencies. However construction of pond, heap leach pads, process facilities, must not commence until a construction permit has been issued.

Design Criteria

Project Scheduling:

The project will be reviewed in total and when a construction permit is issued it will be for the entire project. It shall state that substantial continuous construction must commence within one (1) year of the issuance of the construction permit or the construction permit will be revoked. If the construction of these facilities is not on a substantial continuous basis the construction permit will be subject to review and may be extended or reevaluated and reissued.

Heap Leach Pads:

The heap leach pads will have Three (3), seventeen (17) foot lifts of ore stacked upon them to a total height of fifty-one (51) feet.

The four (4) heap leach pads, which total approximately 156.3 acres, shall be sized as follows:

South East Heap Leach Pad	25.7 Acres
South West Heap Leach Pad	34.2 Acres
North West Heap Leach Pad	50.7 Acres
North East Heap Leach Pad	45.7 Acres

The heap leach pad liner system shall consist of the following commencing at the top:

- a. Process solution collection system which limits the hydraulic head on the primary liner to twelve (12) inches or less. A system to monitor the head of process fluids on the flexible membrane primary liner.

- b. Primary liner consisting of sixty (60) mil High Density Polyethylene (HDPE) constructed according to approved engineering specifications.
- c. Secondary clay liner consisting of one (1) foot of 1.0×10^{-7} centimeters per second permeability clay with the optimum moisture content achieved and additive materials being mixed in a pug mill or an equivalent mixing device. Also that the clay will be constructed according to approved engineering specifications.
- d. Leak detection media consisting of three (3) inches minimum of continuous uncontaminated sand with a maximum of 3 per cent passing the No. 200 sieve. The spacing of the leak detection piping and the permeability rate of the leak detection media will be defined in the design and included as a condition in the construction permit. There shall be at least three (3) orders of magnitude difference in permeability rate between the leak detection media and the leak detection base or equivalent. The maximum permeability rate of the leak detection base shall be 1.0×10^{-5} centimeters per second.
- e. Leak detection base consisting of six (6) inches minimum of fine grained, low permeability material free of pockets or lenses of sand and/or gravel. Beds of sand and gravel capping the ridges on which pads and ponds are to be constructed are to be stripped to underlying fine grained material. The permeability rate of the base will be defined in the design and included as a condition in the construction permit.

If leakage is detected in this system, repairs or other modifications shall be made such that when completed, fluids will no longer flow through the liner system. The quality of the leak detection system base shall be established after excavation to grade has been completed and before scarification and compaction commences. The quality of existing materials shall be established per criteria included in the approved specification for thickness, gradation and plasticity index.

Each heap leach pad leak detection collection pipe will drain into its own leak detection sump which will consist of a drum of acceptable quality that is securely fixed. Each sump will have an overflow which will transmit leakage to a lined containment of adequate capacity to contain all flows.

Process Ponds:

There will be a total of four (4) process ponds with a hydraulic capacity of five (5) million gallons per pond based on calculations contained in B.P. Mineral's letter of 29 April 1988.

The process pond liner system shall consist of the following commencing at the top:

- a. Primary liner consisting of sixty (60) mil HDPE constructed according to the approved engineering specifications.

- b. Leak detection system consisting of HDPE drainage net with transmissivity of 2 to 5 gallons per minute per lineal foot under maximum loading conditions. Some means shall be provided to prevent the drainage net from being pushed into the clay secondary liner.
- c. Secondary clay liner consisting of one (1) foot of 1.0×10^{-7} centimeters per second permeability clay with optimum moisture content being achieved and additives materials being mixed in a pug mill or equivalent mixing device. Also that the clay liner will be constructed according to approved engineering specifications.

Each pond will have a leak detection system which will preferably drain by gravity to a sump. If leakage is detected in this system, repairs or other modifications shall be made such that when completed fluids will no longer flow through the liner system.

The process ponds shall be drawn down to a level before the onset of winter conditions which will insure adequate capacity to contain the design hydraulic winter condition in addition (monitoring to) normal winter time process fluids and normal process pond freeboard.

Groundwater Monitoring:

The wells which shall be monitored as part of this project are the City of Copperton wells, the well designated BC148 and four (4) additional monitoring wells identified on drawing 2-00-202 submitted 22 July 1988.

The wells shall be monitored for 12 consecutive months to establish back ground information for Ca, Mg, Na, K, HCO_3 , SO_4 , Cl, Fe, Mn, Copper, Silver, Gold, total and free cyanide.

After back ground information has been established, the City of Copperton wells and the four (4) monitoring wells will be monitored *every 2 weeks?* bimonthly and the well designated BC148 will be monitored quarterly.

Storm Water Runoff:

The storm water runoff system shall be capable of containing the 10 year 24 hour storm event from all disturbed areas. Sediment levels within each retention pond will be monitored by a pipe located by survey in the margin of each pond. Sediment will be removed periodically to insure adequate hydraulic containment capacity.

The Melco pit storm water runoff will be controlled by silt fences which shall be maintained in good functioning condition and by the existing impoundment in Dry Fork Canyon on Kennecott's property.

Process Area:

The process facilities shall be entirely contained in a lined area of design such that a catastrophic failure of tankage, vessels, pipes etc. will be hydraulically totally contained in an acceptably lined area.

Mine Waste Rock:

Per Division of Oil Gas and Mining requirements the Sulfide mine waste rock shall be identified and mixed with oxide and limestone waste rock in the waste rock pile to achieve an acceptable acid neutralization potential. Also the final cover material over the waste rock pile shall be at least two (2) feet thick of non-sulfide-bearing waste rock.

Mine Generated Water:

Any mine water generated from the Barney's Canyon pit will be either contained within the pit or used for process waste makeup. The water may also be used for dust suppression if it is of acceptable quality and the application rates and procedures are such that surface run off will not occur.

Process Piping:

All process piping shall be routed within the lined area of the pads or ponds or be contained within a lined ditch which will convey any leach or spillage to a lined area of sufficient capacity to contain all leakage or spillage.

Design Life:

The design life of the project will be fifteen (15) years or less.

Neutralization criteria:

The neutralization criteria shall be as follows or as adopted by the Water Pollution Control Committee before or at the time of decommissioning.

- a. pH of 6.5 to 8.0
- b. Weak acid dissociable (WAD) cyanides less than or equal to 0.20 mg/l.
- c. Total cyanide less than or equal to 0.75 mg/l.
- d. Metals content shall meet drinking water standards.

These parameters must be verified in three (3) tests reasonably spaced during a twenty-four (24) hour period. These originally required standard are maintained because of the perceived discharge of precipitation from the neutralized and reclaimed dump into the ground water system. Finally once the above neutralization criteria has been achieved and reclamation completed the spent ore pile must remain undisturbed for at least six (6) years to allow for the natural decomposition of any localized pockets of cyanide.

Once the construction permit has been issued and the construction of the facilities completed; the facilities may not be placed in service until authorized to do so in writing by the Bureau of Water Pollution Control.

Mr. Gerald Schurtz
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This concludes the summary of approved design criteria for the Barney's Canyon project. It is in the best interests of the project and it is required that a twenty (20) per cent and fifty (50) per cent design evaluation meeting be held with the Bureau of Water Pollution Control to establish compliance with these design criteria. Also, B.P. Minerals will assist in periodic field inspections by Bureau of Water Pollution Control personnel during the construction period.

Please call Charlie Dietz of my staff if there are any questions.

Sincerely,

Utah Water Pollution Control Committee



Don A. Ostler, P.E.
Executive Secretary

cc: Mr. Gregory Boyce, General Manger, Barney's Canyon Mine
Mr. Kent Miner, Salt Lake City/County Health Department
Mr. Brian Buck, JBR Consultants
Mr. Lowell Braxton, Oil, Gas, and Mining
Mr. Ross Pino, 310 East State Highway, Copperton. Utah 84006
Mr. Steve Harris, Magna Area Elected Council, P.O. Box 456, Magna, Utah
Mr. Blaine Milner, Chairman, Copperton Improvement District, Copperton, Utah

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